

SECTION 737

CONCRETE SURFACE FINISH FOR STRUCTURES

737.01. DESCRIPTION.

This Section covers materials and testing requirements for concrete surface finishing compounds for structures.

737.02. OPTION I - HEAVY CEMENT BASE MORTAR.

(a) **Materials.**

1. Heavy cement base packaged in dry powder form for mixing with water.
 - (a) Plaster mix for plaster gun application.
 - (b) Brush and float mix for brush and float application.
2. *Bonding Agent.* A formulation of acrylic polymers and modifiers in liquid form for use as an additive with portland cement mixes to assure adhesion.

- (b) **Proportioning and Consistency.** The bonding agent and water shall be proportioned in accordance with the manufacturer's recommendations. A copy of those recommendations shall be furnished to the Engineer.

737.03. OPTION II - PAINT TYPE SPRAY FINISH.

- (a) **Materials.** Material for paint type spray finish shall be a textured commercial product designed specifically for this purpose.
- (b) **Testing and Certification.** A list of approved products is kept by the Materials Division. Other brand products may be qualified by the submission of a type A certification and samples to the Materials Division for evaluation of durability and appearance. The Department reserves the right to discontinue approval of products that prove unsatisfactory when used in accordance with the manufacturer's instructions.

Each shipment of the satisfactorily tested product shall be accompanied by a type C certificate from the manufacturer.

Material to be furnished for spray finish (option II) shall conform to the following requirements.

1. *Freeze-Thaw Cycle.* Cast and cure three concrete specimens, not less than 4 inch x 6 inch x 6 inch (101.6 x 152.4 x 152.4 mm) of the mix designed for the structure. Apply the surface finish after moist curing the specimens for 14 days and dry curing them for 24 hours in room air at 60°F to 80°F (15.6 - 26.7°C). Caution shall be taken that there be no excessive oil on specimen forms. Coat sides of specimens (brush permitted) and cure at room temperature for 48 hours, after which:
 - 1.1. Immerse in water at room temperature 60°F to 80°F (15.6°C to 26.7°C) for three hours.
 - 1.2. Place in cold storage at -15°F (-26.1°C) for one hour.
 - 1.3. Thaw at room temperature -15°F (15.6°C to 26.7°C) for one hour minimum.
 - 1.4. Repeat steps 1.2 and 1.3 to complete a total of 50 cycles.

At the end of 50 cycles of freeze-thaw test, the specimens shall show no visible defects.

2. *Accelerated Weathering.* The material shall be subjected to a 5000 hour exposure test in a twin-arc-weatherometer at an operating temperature of 145°F (62.8°C). The test shall be made at 20 minute cycles consisting of 17 minutes of light and 3 minutes of water spray plus light. At the end of said exposure test, the exposed sample must not show any chipping, flaking or peeling.
3. *Flexibility.* The material, when applied to a thin metal plate at a spreading rate to $45 \pm 5 \text{ ft}^2/\text{gallon}$ ($1.10 \pm 0.12 \text{ m}^2/\text{L}$) shall bend without breaking the film at an angle of 180 degrees over a 25.4 mm mandrel.
4. *Fungus Growth Resistance.* The material to be used shall pass a fungus resistance test as described by Federal Specification TT-P-29b with a minimum incubation period of 21 days where no growth shall have been indicated after the test.
5. *Abrasion Test.* When tested for abrasion resistance in accordance with ASTM C418, the loss shall not be greater than $0.5 \text{ cm}^3/\text{cm}^2$
6. *Salt Spray Resistance.* The material, when applied to concrete at a rate of $50 \text{ ft}^2/\text{gallon}$ ($1.23 \text{ m}^2/\text{L}$) and tested in accordance with ASTM B117 with the coating exposed to a 5 percent sodium chloride (salt solution) for 300 hours and maintained at $90^\circ\text{F} \pm 2^\circ\text{F}$ ($32.2 \pm 1.1^\circ\text{C}$) during the period of exposure, shall show no loss of adhesion or deterioration at the end of the 300 hours exposure to the salt spray.

SECTION 738 ELECTRICAL CONDUCTORS

DESCRIPTION. This section covers the requirements of materials for electrical conductors of the size, type and the locations shown on the Plans or established by the Engineer in Section 811 and 834.

738.01. TRAFFIC SIGNAL WIRE AND CABLE.

- (a) Traffic and Signal Electrical Cable shall comply with the requirements of the International Municipal Signal Association (IMSA) Specifications No. 19-1 or No. 20-1. The conductors shall be copper No. 14 AWG, unless otherwise shown on the Plans.
- (b) Shielded Loop Detector Lead-In Cable shall comply with the requirements of IMSA No. 50-2. The conductors shall be copper No. 14 AWG, unless otherwise shown on the Plans.
- (c) Loop Detector Wire shall comply with the requirements of IMSA No. 51-1 or IMSA No. 51-3 except, when specified on the Plans, IMSA No. 51-5 shall be used. The conductors shall be copper No. 14 AWG, unless otherwise shown on the Plans.

738.02. BUILDING AND SECONDARY DISTRIBUTION WIRE AND CABLE.

- (a) All conductors shall be copper and standard AWG sizes, unless otherwise shown on the Plans.
- (b) Building Wire and Cable shall comply with the applicable requirements of ASTM B 3, ASTM B 8, ASTM B 33, the National Electric Code (NEC) and be rated for 600 volts, unless otherwise specified on the Plans.